Exploiting the Common Data Structure Linking Patient Record and Knowledge Base in the FRAMEMED System

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The purpose of this poster is to show that the format of records of patient encounters in the Chronological Medical Record (CMR) (part 3 of our proposed 4-part patient medical record) are essentially the same as the format of the of the Relational Records in the FRAMEMED knowledge base (FKB). Because the same coded phraseology is used in both types of records and because the items in any record are in code order, any series of records (presently up to 5) can be interdigitated for easy comparison.

The FRAMEMED system [1] is comprised of two major parts: 1) The hierarchical lists for the 26 elements of the system; and 2) The knowledge records linked to the various items in the hierarchical lists. The hierarchical lists not only establish inheritance (hierarchical) relationships but also serve as indexing terms for the knowledge records. A common alphabetical list of the combined hierarchical lists is particularly useful for the indexing and retrieval of the knowledge records.

The knowledge records are of four types: Descriptive, Relational, Conditional, and the recently-added, Protocol type. All knowledge records have the same format, namely: ^Title, Body, and @Author/date. The body of the Descriptive Record is ASCII text. The body of the Relational Record consists of a series of hierarchical codes listed in code order. Conditional Records exist to state (conditional) rules and follow the pattern of Relational Records. Protocol Records are basically textual but may incorporate some standardized coded phrases, and are typically used to describe.a surgical procedure or a multiple drug regimen. When the body of a knowledge record consists of codes, the corresponding phrases are not stored but rematched to their codes for user input or output operations, to save storage space and to allow language switching.

The records in the Chronological Medical Record (CMR) [2] of a patient are essentially Relational Records but with the date of the medical encounter serving as the title. The author is the practitioner involved (without date since that appears in the Title). The body of any CMR record consists of the hierarchical codes for the patient findings or services related to that encounter. Since phrases are matched to the stored codes only on user input/output operations, a patient's CMR may be entered in one language and displayed in another.

The code order that prevails in all Relational-type Records, including the patient's CMR, allows a series (presently up to 5) of such records to be displayed in interdigitated form. Any mix of Relational-type records can be displayed in the interdigitated way, with the rows representing the coded items and columns marking their presence or absence in those records. For example, the profiles of several diseases can be simultaneously displayed, or a patient's profile can be compared with several diseases on the differential diagnosis list. Such a comparison of the findings of several diseases is not readily accomplished from textbook descriptions since the findings there are often not expressed in identical phraseology and almost never listed in hierarchical code order.

Indeed, it is this characteristic of the FRAMEMED Relational Record pattern that allows the immediate comparison of any one Relational-type Record to any other. Drug profiles can be compared in this simultaneous display format. A patient's profile can be displayed against the drugs he is taking, to see which of his findings could be attributed to his drug regimen. A patient with a chronic disease could have the findings of that disease deleted from his profile of findings, to determine if another disease might also be present.

FRAMEMED is a software platform of unusual, if not unique design, allowing simultaneous, interdigitated display of many different kinds of knowledge or patient records. Even more power can be added by keying records to references or multimedia display programs.

References

[1] Bishop CW, Ewing PD. FRAMEMED, a prototypical medical knowledge base of unususal design. M.D.Computing, 1993;10[3]:184-92
[2] Bishop CW. A new format for the medical record. M.D.Computing, 1991;8[4]:208-15

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